FluWatch

Public Health Agency of Canada | Agence de la santé publique du Canada

April 22 to 28, 2018 (Week 17)

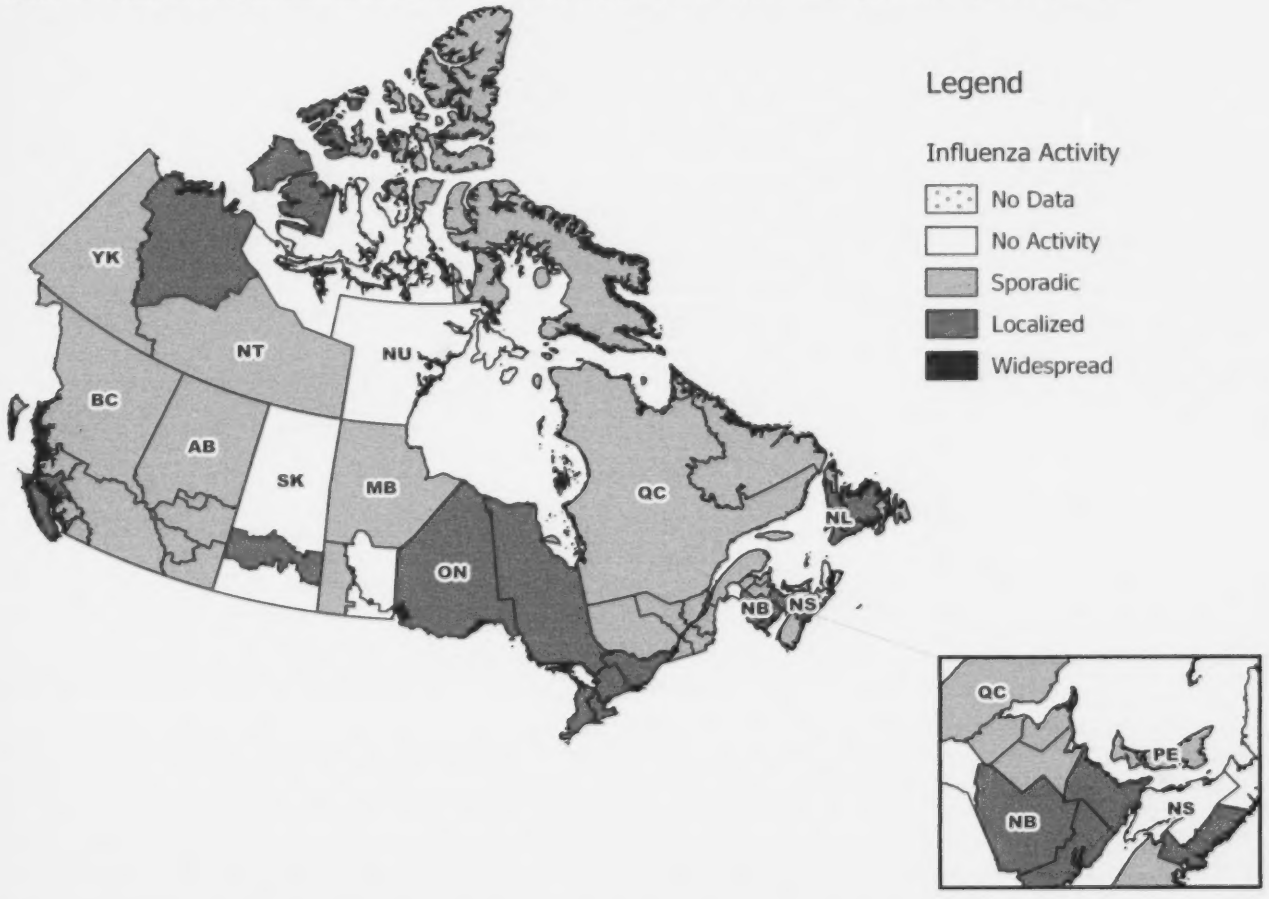
Overall Summary

- Overall, influenza activity in Canada continued to decrease, but parts of the country are still reporting localized activity.
- The number of regions reporting no influenza activity increased from the previous week.
- Detections of influenza A were greater than those of influenza B.
- To date this season, the majority of laboratory-confirmed cases, hospitalizations and deaths with influenza have been among adults 65 years of age and older.
- For more information on the flu, see our Flu(influenza) web page.

Influenza/Influenza-like Illness (ILI) Activity (geographic spread)

In week 17, 16 regions (BC(1), SK(1), ON(7), NB(3), NL(2), NS(1) and NT(1)) reported localized activity. Nine regions (SK(2), MB(2), NB(1), NS(2) and NU(2)) reported no influenza activity.

Figure 1 – Map of overall influenza/ILI activity level by province and territory, Canada, week 2018-17

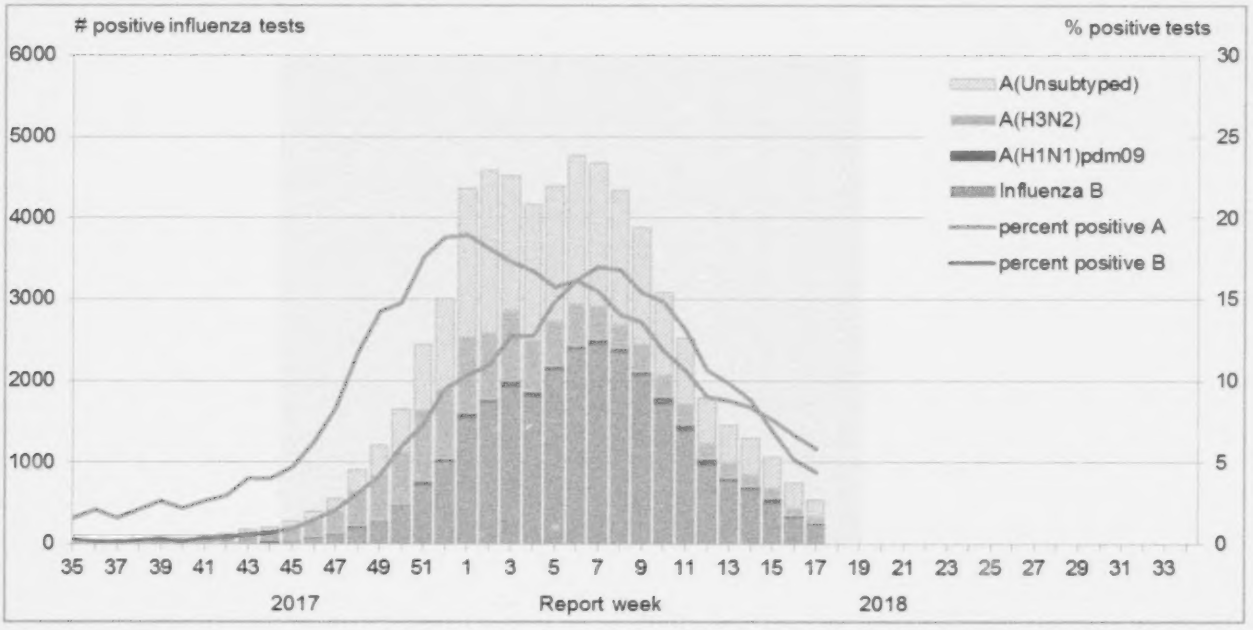


Laboratory-Confirmed Influenza Detections

In week 17, the percentage of tests positive for influenza was 10%, a decrease from the previous week. Laboratory detections of influenza are steadily decreasing. In week 17, 526 positive influenza tests were reported, down from 719 tests reported in week 16. Influenza A accounted for 57% of influenza detections in week 17.

Overall, laboratory detections of influenza are around the average for this time of year. For data on other respiratory virus detections, see the Respiratory Virus Detections in Canada Report.

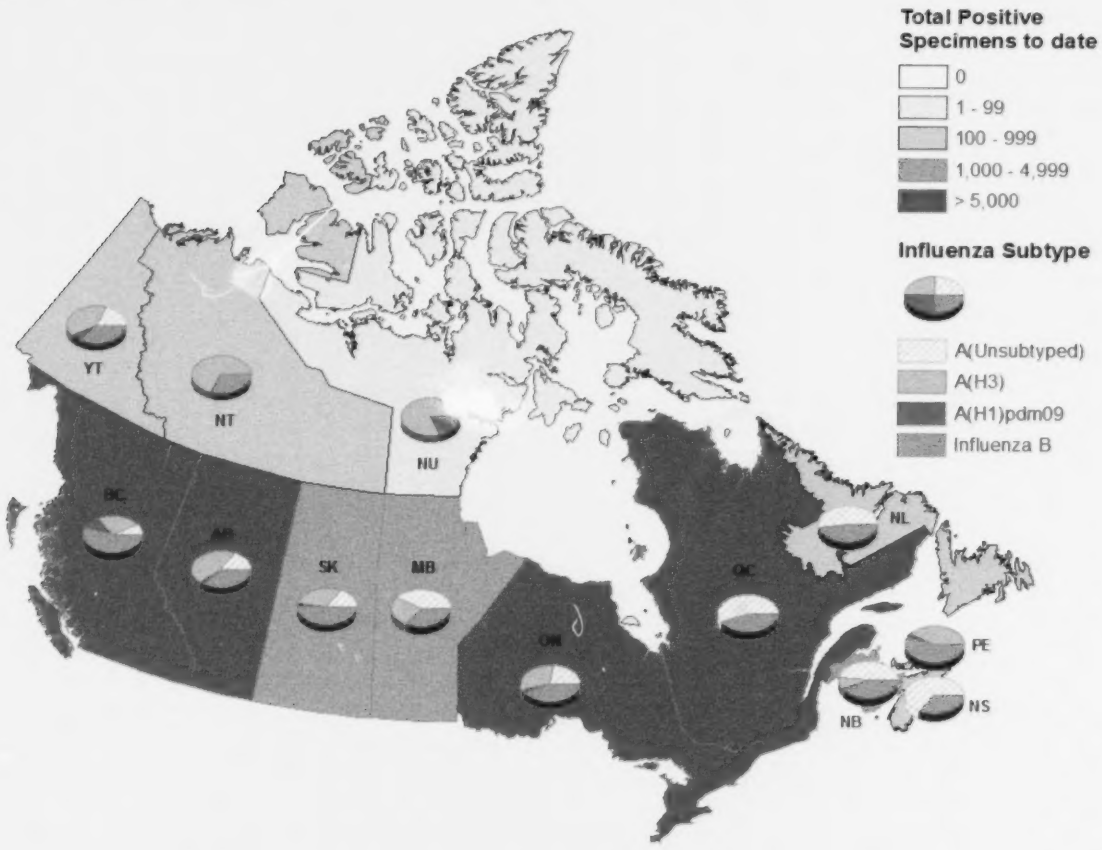
Figure 2 – Number of positive influenza tests and percentage of tests positive, by type, subtype and report week, Canada, weeks 2017-35 to 2018-17



The shaded area indicates weeks where the positivity rate was at least 5% and a minimum of 15 positive tests were observed, signalling the period of seasonal influenza activity.

To date this season, 63,476 laboratory-confirmed influenza detections have been reported, of which 56% have been influenza A. Influenza A(H3N2) has been the most common subtype detected this season, representing 90% of subtyped influenza A detections. For more detailed weekly and cumulative influenza data, see the text descriptions for Figures 2 and 3 or the Respiratory Virus Detections in Canada Report.

Figure 3 – Cumulative numbers of positive influenza specimens by type/subtype and province/territory, Canada, weeks 2017-35 to 2018-17



To date this season, detailed information on age and type/subtype has been received for 51,076 laboratory-confirmed influenza cases (Table 1). Adults 65 years of age and older represent the largest proportion of cases overall (50%), and among cases of influenza A(H3N2) (59%) and influenza B (48%). Adults aged 20-64 represent 32% of cases overall and 29% of influenza A(H3N2) and 34% of influenza B cases. Although much smaller in numbers (910), the majority of influenza A(H1N1)pdm09 cases are among adults less than 65 years of age, with adults aged 20-64 and children 0-19 years accounting for 54% and 30% of cases respectively.

Table 1 – Cumulative numbers of positive influenza specimens by type, subtype and age-group reported through case-based laboratory reporting, Canada, weeks 2017-35 to 2018-17

Age groups (years)	Cumulative (August 27, 2017 to April 28, 2018)						
	Influenza A				B	Influenza A and B	
	A Total	A(H1N1) pdm09	A(H3N2)	A (UnS)[1]	Total	#	%
0-4	3125	150	557	2418	1475	4600	9%
5-19	2286	126	539	1621	2544	4830	9%
20-44	4206	255	1186	2765	2748	6954	14%
45-64	4633	233	1436	2964	4662	9295	18%
65+	14884	146	5426	9312	10513	25397	50%
Total	29134	910	9144	19080	21942	51076	100%

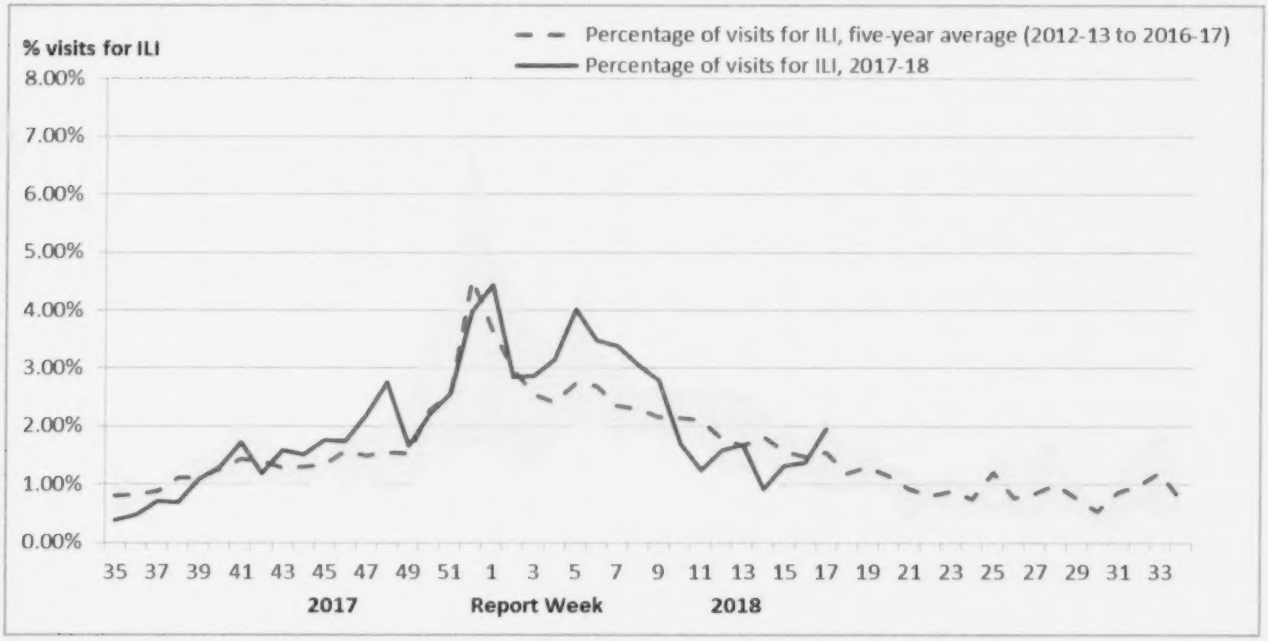
[1]UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available;

Syndromic / Influenza-like Illness Surveillance

Healthcare Practitioners Sentinel Syndromic Surveillance

In week 17, 2.0% of visits to healthcare professionals were due to influenza-like illness (ILI).

Figure 4 – Percentage of visits for ILI reported by sentinels by report week, Canada, weeks 2017-35 to 2018-17
Number of Sentinels Reporting in Week 17: 165



The shaded area represents the maximum and minimum percentage of visits for ILI reported by week from seasons 2012-13 to 2016-17

Participatory Syndromic Surveillance

FluWatchers is a participatory ILI surveillance system that relies on weekly voluntary submissions of syndromic information from Canadians across Canada.

In week 17, 1,319 participants reported to FluWatchers, of which 2% reported symptoms of cough and fever, and 10% of these consulted a healthcare professional. Among participants who reported cough and fever, 80% reported days missed from work or school, resulting in a combined total of 35 missed days of work or school.

Table 2 – Summary of influenza-like illness symptoms reported by participating Canadians, Canada, week 2018-17

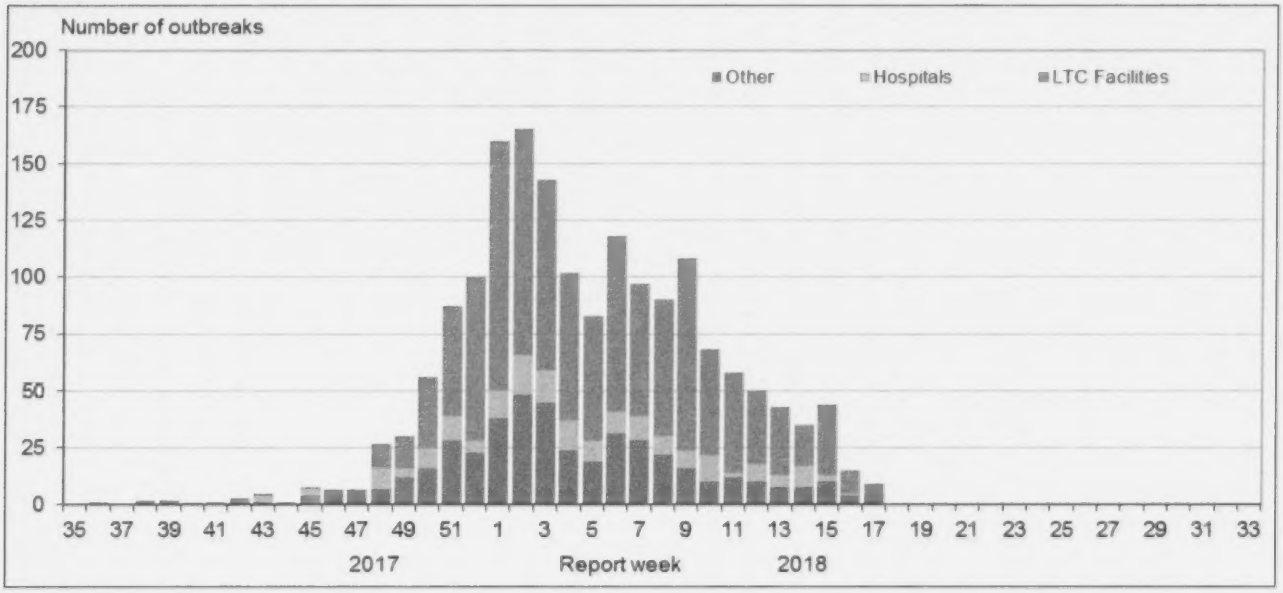
Number of Participants Reporting	Percentage participants reporting Cough and Fever	Percentage of participants with cough and fever who consulted a healthcare professional	Percentage of participants with cough and fever who reported missed days from work or school	Number of missed days from work or school
1319	2%	10%	80%	35

Influenza Outbreak Surveillance

In week 17, nine laboratory-confirmed outbreaks of influenza were reported. Among the reported influenza outbreaks, six were reported in long-term care facilities (LTC) and three in other settings. In addition, one ILI outbreak was reported in a school. Among the seven outbreaks with influenza type/subtype reported, five (71%) were associated with influenza B and two (29%) were associated with influenza A.

To date this season, 1,778 influenza/ILI outbreaks have been reported, of which 1,098 (62%) occurred in LTC facilities. Among the 1,520 outbreaks for which the influenza type/subtype was reported, 836 (55%) were associated with influenza A and 615 (40%) were associated with influenza B, and 69 (5%) were associated with a mix of A and B.

Figure 5 – Number of new outbreaks of laboratory-confirmed influenza by report week, Canada, weeks 2017-35 to 2018-17



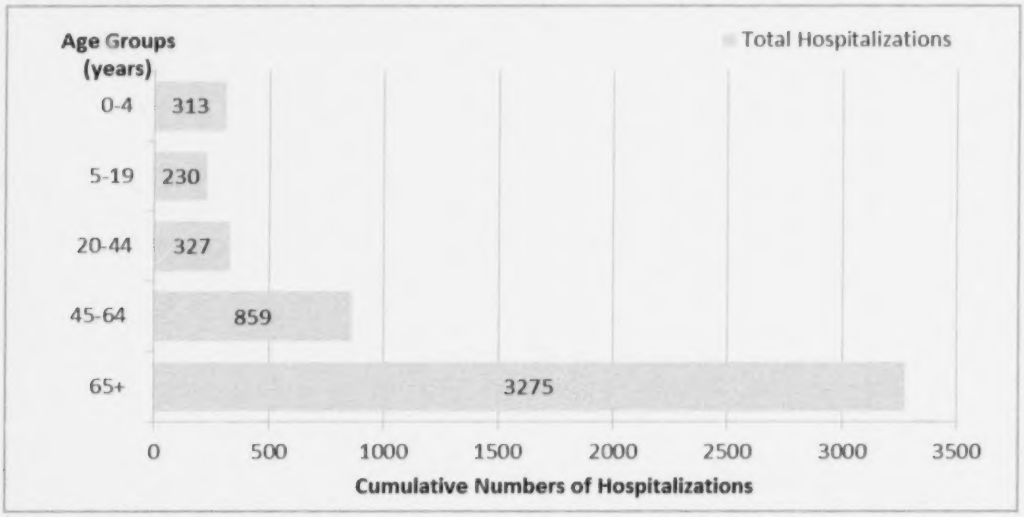
Severe Outcomes Influenza Surveillance

Provincial/Territorial Influenza Hospitalizations and Deaths

To date this season, 5,004 influenza-associated hospitalizations were reported by participating provinces and territories[1]. Among the hospitalizations, 3,337 (67%) were associated with influenza A, and 3,275 cases (65%) were in adults 65 years of age or older.

Additionally, 504 ICU admissions and 278 deaths have been reported to date. Adults aged 65 years of age or older accounted for the greatest proportion of ICU cases (44%), followed by adults aged 20-64 (40%). Adults aged 65 years of age or older accounted the majority of deaths (85%).

Figure 6 - Cumulative numbers of hospitalizations by age-group reported by participating provinces and territories[1], weeks 2017-35 to 2018-17



[1]Influenza-associated hospitalizations are reported by NL, PE, NS, NB, MB, AB, YT and NT. Only hospitalizations that require intensive medical care are reported by SK.

Pediatric Influenza Hospitalizations and Deaths

In week 17, 12 laboratory-confirmed influenza-associated pediatric (≤16 years of age) hospitalizations were reported by the Immunization Monitoring Program Active (IMPACT) network. Influenza A accounted for 67% of the hospitalizations. Pediatric hospitalizations have been on a general decline since week 07. The number of weekly reported hospitalizations are below the seven-season average.

To date this season, 1,054 pediatric hospitalizations have been reported by the IMPACT network, 654 (62%) of which were associated with influenza A. Children 0-23 months accounted for the largest proportion of influenza A hospitalizations (39%). Among the 400 hospitalizations due to influenza B, children 5-9 years accounted for the largest proportion of cases (31%).

Additionally, 179 ICU admissions and nine deaths have been reported to date. Children aged 0-23 months accounted for the greatest proportion of ICU cases (30%), followed by children aged 5-9 years (26%). Among the ICU cases with available information, 63% were due to influenza A and approximately 47% had no reported previous or concurrent medical conditions. All but one reported deaths were among children over the age of two.

Figure 7 - Cumulative numbers of pediatric hospitalizations (≤16 years of age) with influenza by type and age-group reported by the IMPACT network, Canada, weeks 2017-35 to 2018-17

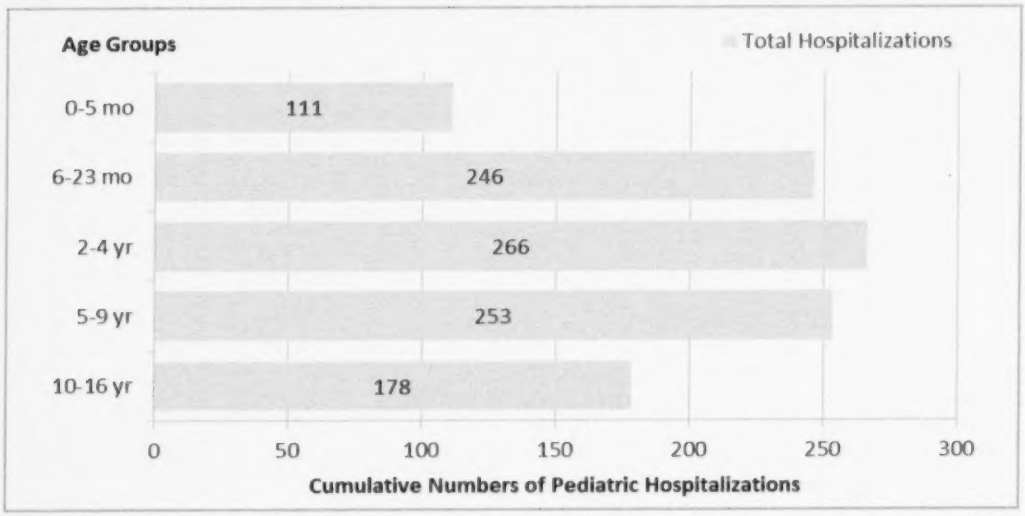
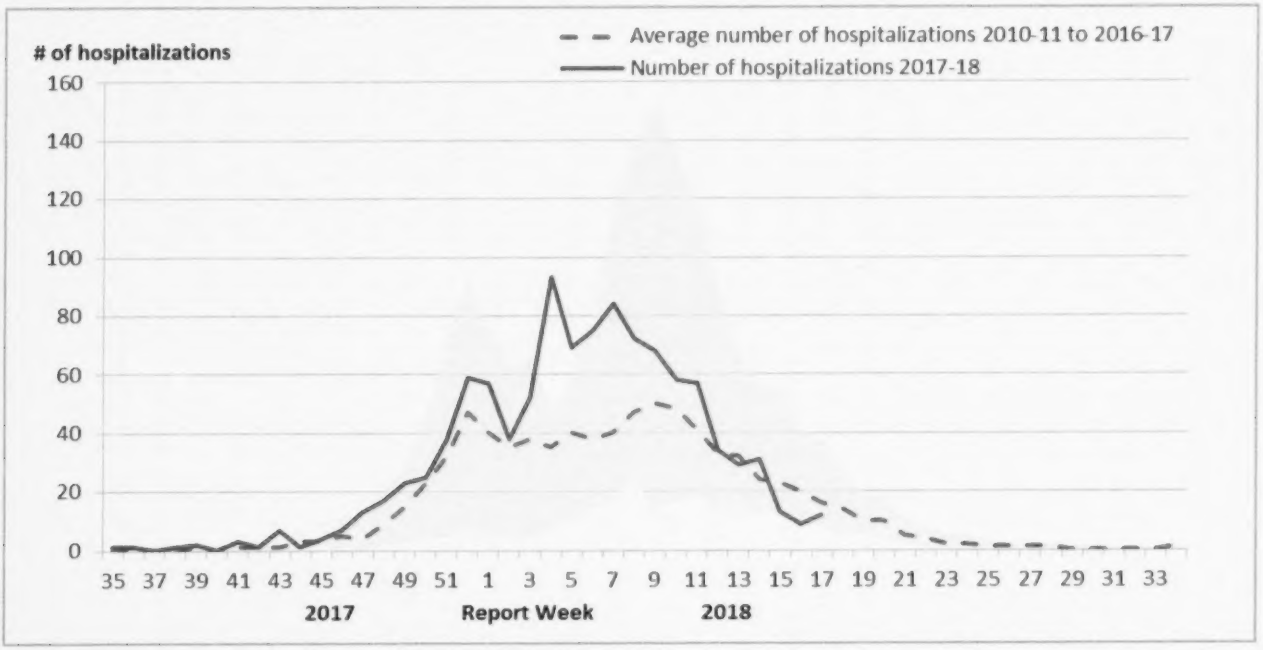


Figure 8 – Number of pediatric hospitalizations (≤16 years of age) with influenza reported by the IMPACT network, by week, Canada, weeks 2017-35 to 2018-17



The shaded area represents the maximum and minimum number of cases reported by week from seasons 2010-11 to 2016-17

Influenza Strain Characterizations

During the 2017-18 influenza season, the National Microbiology Laboratory (NML) has characterized 3,358 influenza viruses [1,426 A(H3N2), 252 A(H1N1)pdm09 and 1,680 B viruses] that were received from Canadian laboratories.

Antigenic Characterization

Among influenza viruses characterized by hemagglutination inhibition (HI) assay during the 2017-18 season, most viruses were antigenically similar to the cell-culture propagated reference strains recommended by WHO.

Table 3 – Influenza antigenic strain characterizations, Canada, weeks 2017-35 to 2018-17

Strain Characterization Results	Count	Description
Influenza A (H3N2)		
A/Hong Kong/4801/2014-like	291	Viruses antigenically similar to A/Hong Kong/4801/2014, the A(H3N2) component of the 2017-18 Northern Hemisphere's **trivalent** and **quadrivalent** vaccine.
Reduced titer to A/Hong Kong/4801/2014	84	These A(H3N2) viruses reacted poorly with antisera raised against cell-propagated A/Hong Kong/4801/2014, suggesting some antigenic differences.
Influenza A (H1N1)pdm09		
A/Michigan/45/2015-like	252	Viruses antigenically similar to A/Michigan/45/2015, the A(H1N1)pdm09 component of the 2017-18 Northern Hemisphere's **trivalent** and **quadrivalent** influenza vaccine.
Influenza B		
B/Brisbane/60/2008-like (Victoria lineage)	20	Viruses antigenically similar to B/Brisbane/60/2008. B/Brisbane/60/2008 is the influenza B component of the 2017-18 Northern Hemisphere's **trivalent** and **quadrivalent** influenza vaccine.
Reduced titer to B/Brisbane/60/2008 (Victoria lineage)	51	These B/Victoria lineage viruses reacted poorly with antisera raised against cell-propagated B/Brisbane/60/2008, suggesting some antigenic differences.
B/Phuket/3073/2013-like (Yamagata lineage)	1,609	Viruses antigenically similar to B/Phuket/3073/2013, the additional influenza B component of the 2017-18 Northern Hemisphere **quadrivalent** influenza vaccine.

Genetic Characterization of A(H3N2) viruses

During the 2017-18 season, 1,051 A(H3N2) viruses did not grow to sufficient titers for antigenic characterization by HI assay. Therefore, genetic characterization was performed to determine to which genetic group they belong. Sequence analysis showed that 942 A(H3N2) viruses belonged to genetic group 3C.2a, 107 viruses belonged to subclade 3C.2a1 and two viruses belonged to the clade 3C.3a.

Additionally, of the 291 influenza A(H3N2) viruses that were characterized antigenically as similar to A/Hong Kong/4801/2014, 265 belonged to genetic group 3C.2a and 26 viruses belonged to subclade 3C.2a1. The 84 viruses that showed reduced titer to A/Hong Kong/4801/2014 belonged to genetic clade 3C.3a.

A/Hong Kong/4801/2014-like virus belongs to genetic group 3C.2a and is the influenza A/H3N2 component of the 2017-18 Northern Hemisphere influenza vaccine.

Genetic Characterization of Influenza B viruses

Among the viruses characterized antigenically as having reduced titer to ferret antisera produced against cell-propagated B/Brisbane/60/2008, sequence analysis showed that 49 viruses had a two amino acid deletion in the HA gene. Sequencing is pending for the remaining two virus isolates.

Antiviral Resistance

During the 2017-18 season, the National Microbiology Laboratory (NML) has tested 1,450 influenza viruses for resistance to oseltamivir and 1,446 viruses for resistance to zanamivir. All but three viruses (1 A(H1N1)pdm09,1 A(H3N2) and 1 influenza B) were sensitive to oseltamivir and all but two influenza B viruses were sensitive to zanamivir (Table 4). The A(H1N1)pdm09 virus resistant to oseltamivir had a H275Y mutation.

Table 4 – Antiviral resistance by influenza virus type and subtype, Canada, weeks 2017-35 to 2018-17

Virus type and subtype	Oseltamivir		Zanamivir	
	# tested	# resistant (%)	# tested	# resistant (%)
A (H3N2)	540	1 (0.2%)	536	0 (0%)
A (H1N1)pdm09	204	1 (0.5%)	204	0 (0%)
B	706	1 (0.1%)	706	2 (0.3%)
TOTAL	1450	3 (0.2%)	1446	2 (0.1%)

Note: Since the 2009 pandemic, all circulating influenza A viruses have been resistant to amantadine, and it is therefore not currently recommended for use in the treatment of influenza. During the 2017-18 season, all but eight influenza A viruses that were tested for resistance to amantadine were resistant.

Provincial and International Influenza Reports

- Alberta – Influenza Surveillance Report
- British Columbia – Influenza Surveillance
- Manitoba - Manitoba – Seasonal Influenza Reports
- New Brunswick – Influenza Surveillance Reports
- Newfoundland and Labrador – Surveillance and Disease Reports
- Nova Scotia – Respiratory Watch Report
- Ontario – Respiratory Pathogen Bulletin
- Prince Edward Island – Weekly Influenza Summary
- Saskatchewan – Influenza Reports
- Québec – Flash Grippe
- Australia – Influenza Surveillance Report
- European Centre for Disease Prevention and Control – Surveillance reports and disease data on seasonal influenza
- New Zealand – Influenza Weekly Update
- Public Health England – Weekly national flu reports
- Pan-American Health Organization – Influenza Situation Report
- United States Centres for Disease Control and Prevention – Weekly Influenza Surveillance Report
- World Health Organization – Influenza update
- World Health Organization – FluNet

FluWatch Surveillance for the 2017-2018 Season – Notes and Definitions

The FluWatch report is compiled from a number of data sources. Surveillance information contained in this report is a reflection of the surveillance data available to FluWatch at the time of production. Delays in reporting of data may cause data to change retrospectively

Influenza/Influenza-like Illness (ILI) Activity

Influenza/ILI activity levels, as represented on the map, are assigned and reported by Provincial and Territorial Ministries of Health, based on laboratory confirmations, primary care consultations for ILI and reported outbreaks. ILI data may be reported through sentinel physicians, emergency room visits or health line telephone calls, and the determination of an increase is based on the assessment of the provincial/territorial epidemiologist. Maps from previous weeks, including any retrospective updates, are available in the mapping feature found in the Weekly Influenza Reports.

Influenza/ILI Activity Level definitions

1 = No activity: no laboratory-confirmed influenza detections in the reporting week, however, sporadically occurring ILI may be reported

2 = Sporadic: sporadically occurring ILI and lab confirmed influenza detection(s) with **no outbreaks** detected within the influenza surveillance region†

3 = Localized: (1) evidence of increased ILI* ; (2) lab confirmed influenza detection(s); (3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring in **less than 50% of the influenza surveillance region†**

4 = Widespread: (1) evidence of increased ILI*; (2) lab confirmed influenza detection(s);(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring in **greater than or equal to 50% of the influenza surveillance region†**;

* More than just sporadic as determined by the provincial/territorial epidemiologist.

†Influenza surveillance regions within the province or territory as defined by the provincial/territorial epidemiologist

Laboratory-Confirmed Influenza Detections

Provincial, regional and some hospital laboratories report the weekly number of tests and detections of influenza and other respiratory viruses. Provincial public health laboratories submit demographic information for cases of influenza. This case-level data represents a subset of influenza detections reported through aggregate reporting. Specimens from NT, YT, and NU are sent to reference laboratories in the provinces for testing. Cumulative data includes updates to previous weeks. Discrepancies in values in Figures 2 and 3 may be attributable to differing data sources.

Syndromic/Influenza-like Illness Surveillance

FluWatch maintains a network of primary care practitioners who report the weekly proportion of ILI cases seen in their practice. Independent sentinel networks in BC, AB, and SK compile their data for reporting to FluWatch. Not all sentinel physicians report every week.

Definition of Influenza-like-illness (ILI): Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration which is likely due to influenza. In children under 5 years of age, gastrointestinal symptoms may also be present. In patients under 5 or 65 years and older, fever may not be prominent.

Influenza Outbreak Surveillance

Outbreaks of influenza or ILI are reported from all provinces and territories, according to the definitions below. However, reporting of outbreaks of influenza/ILI from different types of facilities differs between jurisdictions. All provinces and territories with the exception of NU report influenza outbreaks in long-term care facilities. All provinces and territories with the exception of NU and QC report outbreaks in hospitals.

Outbreak definitions:

Schools: Greater than 10% absenteeism (or absenteeism that is higher (e.g. >5-10%) than expected level as determined by school or public health authority) which is likely due to ILI.

Hospitals and residential institutions: two or more cases of ILI within a seven-day period, including at least one laboratory-confirmed case of influenza. Residential institutions include but are not limited to long-term care facilities (LTCF) and prisons.

Workplace: Greater than 10% absenteeism on any day which is most likely due to ILI.

Other settings: two or more cases of ILI within a seven-day period, including at least one laboratory-confirmed case of influenza; i.e. closed communities.

Serious Outcome Influenza Surveillance

Provincial/Territorial Influenza Hospitalizations and Deaths

Influenza-associated hospitalizations and deaths are reported by 8 Provincial and Territorial Ministries of Health (excluding BC, NU, ON and QC). The hospitalization or death does not have to be attributable to influenza, a positive laboratory test is sufficient for reporting. Only hospitalizations that require intensive medical care are reported by SK.

Due to changes in participating provinces and territories, comparisons to previous years should be done with caution.

Pediatric Influenza Hospitalizations and Deaths

The Immunization Monitoring Program Active (IMPACT) network reports the weekly number of hospitalizations with influenza among children admitted to one of the 12 participating paediatric hospitals in 8 provinces. These represent a subset of all influenza-associated pediatric hospitalizations in Canada.

Influenza Strain Characterizations and Antiviral Resistance

Provincial public health laboratories send a subset of influenza virus isolates to the National Microbiology Laboratory for strain characterization and antiviral resistance. These represent a subset of all influenza detections in Canada and the proportion of isolates of each type and subtype is not necessarily representative of circulating viruses.

Antigenic strain characterization data reflect the results of hemagglutination inhibition (HI) testing compared to the reference influenza strains recommended by WHO. Genetic strain characterization data are based on analysis of the sequence of the viral hemagglutinin (HA) gene.

Antiviral resistance testing is conducted by phenotypic and genotypic methods on influenza virus isolates submitted to the National Microbiology Laboratory. All isolates are tested for oseltamivir and zanamivir and a subset are tested for resistance to amantadine.

Abbreviations: Newfoundland/Labrador (NL), Prince Edward Island (PE), New Brunswick (NB), Nova Scotia (NS), Quebec (QC), Ontario (ON), Manitoba (MB), Saskatchewan (SK), Alberta (AB), British Columbia (BC), Yukon (YT), Northwest Territories (NT), Nunavut (NU).

This report is available on the Government of Canada Influenza webpage.
Ce rapport est disponible dans les deux langues officielles.

We would like to thank all the Fluwatch surveillance partners who are participating in this year's influenza surveillance program.